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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/083,606	02/27/2002	Koudai Yoshizawa	50340-112	7396

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McDERMOTT, WILL & EMERY
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Washington, DC 20005-3096

EXAMINER

ALEJANDRO, RAYMOND

ART UNIT PAPER NUMBER

1745

DATE MAILED: 01/08/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/083,606	YOSHIZAWA ET AL.	
	Examiner	Art Unit	
	Raymond Alejandro	1745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 November 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-53 is/are pending in the application.
- 4a) Of the above claim(s) 7,9-16,18-28 and 30-53 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6,8,17 and 29 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 February 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) <u>02/27/02</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Applicant's election with traverse of Group I and Species I (claims 1-6, 8, 17 and 29) in the response dated 11/24/03 is acknowledged. The traversal is on the ground(s) that "the division of claims...is between a product and a method pf providing a protected fuel cell", and "this represents a single inventive concept". This is not found persuasive because the particular search for the elected claims is not required for non-elected claims, that is, the search required for the fuel cell having the specific protection device which is classified in class 429/26 is not particularly required for method of protecting the fuel cell per se being classified in class 429/13. As presented in the instant claims, the inventive concepts involve both the fuel cell itself and the method protecting thereof. However, since the restriction requirement has been treated as process and apparatus for its practice, it is further noted that the inventions are distinct because the apparatus can be used to practice another and materially different process, for example, a process involving the use of any other heat generating device such as an electric heating source or fossil heating source; or a combustor or a process involving the use of a coolant substance dissolved in the reactant stream; additionally, the process as claimed can be practiced by another materially different apparatus, for instance, by an internal combustion engine, a burner, or chemical reactor or an electroplating device or electrolyzer. Accordingly, serious burden would be raised if the search of both different methods was made as required for the separate and distinct inventions.
2. With respect to the distinct species, it is noted that as admitted by the applicant and disclosed in the specification, at least, several figures (i.e. Figure 1, 5-6, 8-9, 15, 20, 25, 27, 29) include separate and distinct embodiments. Thus, the disclosure encompasses different and

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separated embodiments which are mutually exclusive. Accordingly, serious burden would be raised if the search of both different methods was made as required for the separate and distinct inventions.

The requirement is still deemed proper and is therefore made FINAL.

Information Disclosure Statement

3. The information disclosure statement (IDS) submitted on 02/27/02 was considered by the examiner.

Drawings

4. The drawings were received on 02/27/02. These drawings are acceptable.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

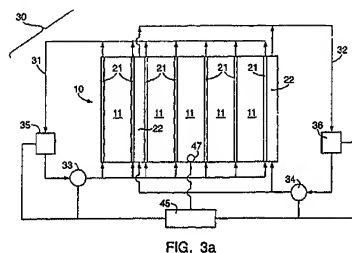
6. Claims 1-6, 8, 17 and 29 are rejected under 35 U.S.C. 102(e) as being anticipated by Bonville 6248462.

The present application is directed to a fuel cell system wherein the claimed inventive concept comprises its specific protection devices. Other limitations include the specific protection devices; the thawing device; the porous member; and the controller.

As to claims 1 and 29:

Bonville disclosed an apparatus for thermal management of a fuel cell assembly (TITLE) wherein a plurality of thermal management loops in contact with the fuel cell assembly are utilized to maintain the fuel cell assembly above freezing or raise the fuel cell assembly above freezing temperature (ABSTRACT).

Figure 3 below shows the fuel cell stack 10, a primary thermal management loop having a cool flow channel in thermal communication with the fuel cell and circulating a coolant; a secondary thermal management loop circulating an antifreeze flow channel spaced along the fuel cell stack; a heat exchanger in thermal communication with the secondary management loop; a thermal management loop controller which regulates said heat exchanger as to maintain said temperature above 32°F (CLAIM 9).



It is disclosed that the present invention provides for a dual thermal management loop apparatus having two thermal management loops (COL 9, line 65 to COL 10, line 7). It is further disclosed that the controller 45 controls both the primary and secondary thermal management loops according to a predetermined set of parameters to effect water management as well as ensuring that the fuel cell is not overheated (COL 8, lines 20-30); the controller also regulates the heat exchanger and pump by accepting temperature data from a temperature sensor to ensure that

the fuel cell stack does not fall below freezing or alternatively, may be activated at a time after the fuel cell stack has fallen below freezing to quickly bring the fuel cell up above freezing (COL 8, lines 30-41). *Thus, these thermal management loops act as the protection devices for preventing freezing of water by maintaining the temperature of the fuel cell and, at the same time, by draining/circulating water therein.*

It is also disclosed that the primary thermal management loop provides regulation to the coolant flow within the fuel cell stack by supplying the fuel cell stack with a supply of water coolant which passes through the fuel cell stack (COL 7, lines 31-55). Similarly, the secondary thermal management loop also services the fuel cell stack providing regulation to the antifreeze solution flowing through each of the cooler plates by supplying the fuel cell stack with a supply of an antifreeze solution which passes therethrough and transfer a portion of its heat to the fuel cell assemblies; wherein heat is added by employing the heat exchanger 36 (COL 7, line 57 to COL 8, line 13/COL 6, lines 27-40). *Thus, these thermal management loops act as the protection devices for preventing freezing of water by maintaining the temperature of the fuel cell and, at the same time, by draining/circulating water therein.*

Regarding claims 2 and 4:

Bonville teaches the use of a heat exchanger employing an electric or fossil heating source wherein, in this manner, temperature of the fuel cell stack is maintained or raised above freezing (COL 7, lines 25-30/COL 8, lines 4-14/COL 6, lines 1-12).

As for claim 3:

It is disclosed that the thermal management loops are isolated (ABSTRACT/ COL 10, lines 15-20)

With reference to claim 5:

It is also disclosed that the primary thermal management loop provides regulation to the coolant flow within the fuel cell stack by supplying the fuel cell stack with a supply of water coolant which passes through the fuel cell stack absorbing heat; wherein these heated coolant flows are then exhausted from the fuel cell stack (COL 7, lines 31-46). *Thus, the exhausted water is drained and collected in the fuel cell system.*

As to claim 6:

It is disclosed that the fuel cell can be equipped with an apparatus which maintain the fuel cell stack above freezing temperature, or alternatively, quickly raise the temperature of a frozen fuel cell stack so as to rapidly enable operation of the fuel cell (COL 6, lines 7-12) wherein melting of the fuel cell is achieved (COL 6, lines 42-65). *Hence, this feature acts as the thawing device.*

As to claim 8:

Bonville also teaches the fuel cell assembly have a natural tendency to diffuse through a porous material of the cathode flow field plate and into the coolant channels (COL 5, lines 33-40). *Thus, a porous member is located on the water and gas passages.*

On the matter of claim 17:

Bonville makes known that controller 45 controls both the primary and secondary thermal management loops according to a predetermined set of parameters to effect water management as well as ensuring that the fuel cell is not overheated (COL 8, lines 20-30). *Thus, the controller functions to select the both protection devices.*

Therefore, the claims are anticipated.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Raymond Alejandro whose telephone number is (703) 306-3326. The examiner can normally be reached on Monday-Thursday (8:30 am - 7:00 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick J. Ryan can be reached on (703) 308-2383. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9310.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

Raymond Alejandro
Examiner
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A handwritten signature in black ink, appearing to read 'RAM', with a long horizontal line extending from the end of the signature.